SUE MURPHY

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Despite being encouraged by her teachers to take up medicine, Sue Murphy decided to ignore their advice and became an engineer instead.

Sue didn't want to be a doctor and thought she would do something different. "I guess it was a bit of rebelliousness in choosing engineering as it wasn't seen as a very girl thing to do in those days," Sue said.

"My father is an engineer so I knew vaguely what it was and I'd always done well in maths and science which seemed to be the main prerequisite. I don't know that I really thought about it enough, but I just knew I didn't want to do medicine."

Sue thinks the sheer diversity of things that engineers cover as part of their daily role is unbelievable. "That's something I had no appreciation of when I started the journey," she said. "I don't think I was particularly motivated towards what I understood engineering to be, which is not how it ought to be, but I think I fell into something that was perfect for me as it turned out." And perfect includes ultimate responsibility for planning, design, construction and commissioning of Australia's first major sea water desalination plant in Perth.

"It has set the benchmark with every other state wanting one," Sue said. "When we started the process nobody was very keen on desalination as a solution. We started producing water last November and in the meantime, Sydney and Melbourne and the Gold Coast have all joined the band wagon. I guess it was a pivotal project in that it mainstreamed seawater desalination in this country," she said.

"The plant provides one sixth of Perth's water supply in a climate-independent fashion so that's the main difference. It's definitely the reason we don't have total sprinkler bans like every other capital city."

Due to the current growth in Western Australia and with continued climate change issues, the Water Corporation has begun work on a second desalination plant south of Perth, which should be on line by 2011.

"Our mantra is 'security through diversity' so we have a wide variety of water sources, groundwater, desalination, dams, demand management, recycling, the whole suite of things to deliver the solutions because the answer can't be one answer, it's lots of answers," Sue said.

"I look at a lot of the issues. We are wrestling with planning for water for Western Australia and it's not simply about building things, it's economic modelling. It's looking at growth in the State, looking at where the people are, looking at the fragility of different water sources and balancing all that out, which is very much an engineering problem."

Sue spent most of her early working life in construction, involved in a number of large projects. "On large projects your goals are very clear," she said. "You want to finish on time and on budget so inherently everyone's lined up and if the project is in a remote or not very pleasant location then you all want to go home, so motivation is very aligned," she said.

"I worked on a large jetty job in South Australia when I was in my 20s and it was a fantastic group of people. We were all about the same age, we were all working hard, long hours and having a marvellous time. It was a great project all round. I think those sort of projects are the things that are high points along the way.'

Sue said she didn't think potential engineers need to have been tinkering with car engines or building things from a very young age to be interested in engineering because engineering is actually about solving problems. "I think logical thought processes in solving problems are equally important in problems that are not so physical," she said.

"I think people get hung up on engineering as bricks and mortar and car engines, which it's not. It's solving a problem with a lot of complex parameters in a way that gives you the optimum solution."

So what are the skills that Sue seeks when looking for young female engineers? "I'm after the ones who boss everyone around in the playground," she said." I think they're the ones who'll be the most useful to us, the ones who don't like things to be chaotic. The ones who like to have a way forward that makes sense and have things organised and happening right."

Sue says engineering is about solving complicated problems. "Some of them are physical problems such as designing a building or a gas plant but some are societal problems such as ensuring water supplies for the future or ensuring environmental stability while developments are happening," she said. "People who are interested in solving complicated problems that are of real importance to the world, they're the people we want in engineering."

If that appeals and resonates with young girls, then that's the direction they should take, according to Sue. "They do need to have an affinity with maths and science," she said.

"If these are a black mysterious world to them then they're probably not going to cut it because even in the non-physical solution type areas you're doing a lot of economic modelling. There's a lot of economic modelling and basic maths logic involved in a lot of things so I guess that's a basic pre-requisite.

"We need people who are curious about things, people who are curious about why things happen the way they do, be it why an engine works or why a building doesn't fall over or why we do things the way we do. I think the curious kids are the ones who will probably enjoy the role."

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Sue recommends young women should look at all types of engineering. "There are as many types of engineering as there are engineers practicing and we should not pigeon hole anybody," she said.

Meanwhile, Sue is concentrating on ensuring Western Australia has water for at least the next 50 years.